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A lifetime perspective on the incentive and distributional effects of the UK tax system

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PRELIMINARY

Motivation

- Tax and benefit reform should be based on a solid understanding of the effects of the tax and benefit system
- A cross-sectional perspective is inadequate – lifecycle outcomes are important
- But understanding of the lifecycle effect of the tax and benefit system limited

Literature

Work incentives

- Extensive work from cross-sectional perspective (Brewer et al, 2010; Adam et al, 2006; Bell et al, 2006)
- But not much that takes lifecycle perspective

Distribution of income and tax burden

- Progressivity of tax system from lifecycle and cross-sectional perspectives (Bengtsson and others, 2011, Piketty and Saez, 2007)
- Redistribution across lifecycle vs across individuals (Bovenberg et al, 2008)
- Distribution of top incomes (Atkinson, 2005, Dell, 2006)

What we do

- Study incentive and distributional effects of current UK personal tax system using a structural dynamic model of the life course
- Focus on:
  - Earned income and its distribution
  - Working life
  - Constant tax and benefit system throughout life to compare cross-section and lifetime effects
- Within this framework, we can
  - Analyse work incentives and how they vary with characteristics
  - Study redistribution from cross-section and lifecycle perspectives
  - Investigate the insurance role of the tax system
  - Control for factors like cohort effects
  - Experiment with policy changes never implemented

This presentation

Two issues:

- How do financial work incentives change over lifecycle?
- How is tax burden distributed over the lifecycle and population?

But first ...

Model: key features (1)

Lifecycle model of female labour supply, human capital and savings

- Life in three stages
  1. Education (up to 18/21)
     - Secondary, A-levels or university (determines type of human capital)
  2. Working life (18/21-59)
     - Labour supply {0, PT, FT} and consumption
     - Marriage and childbearing
  3. Retirement (60-69)
     - Deterministic at age 60

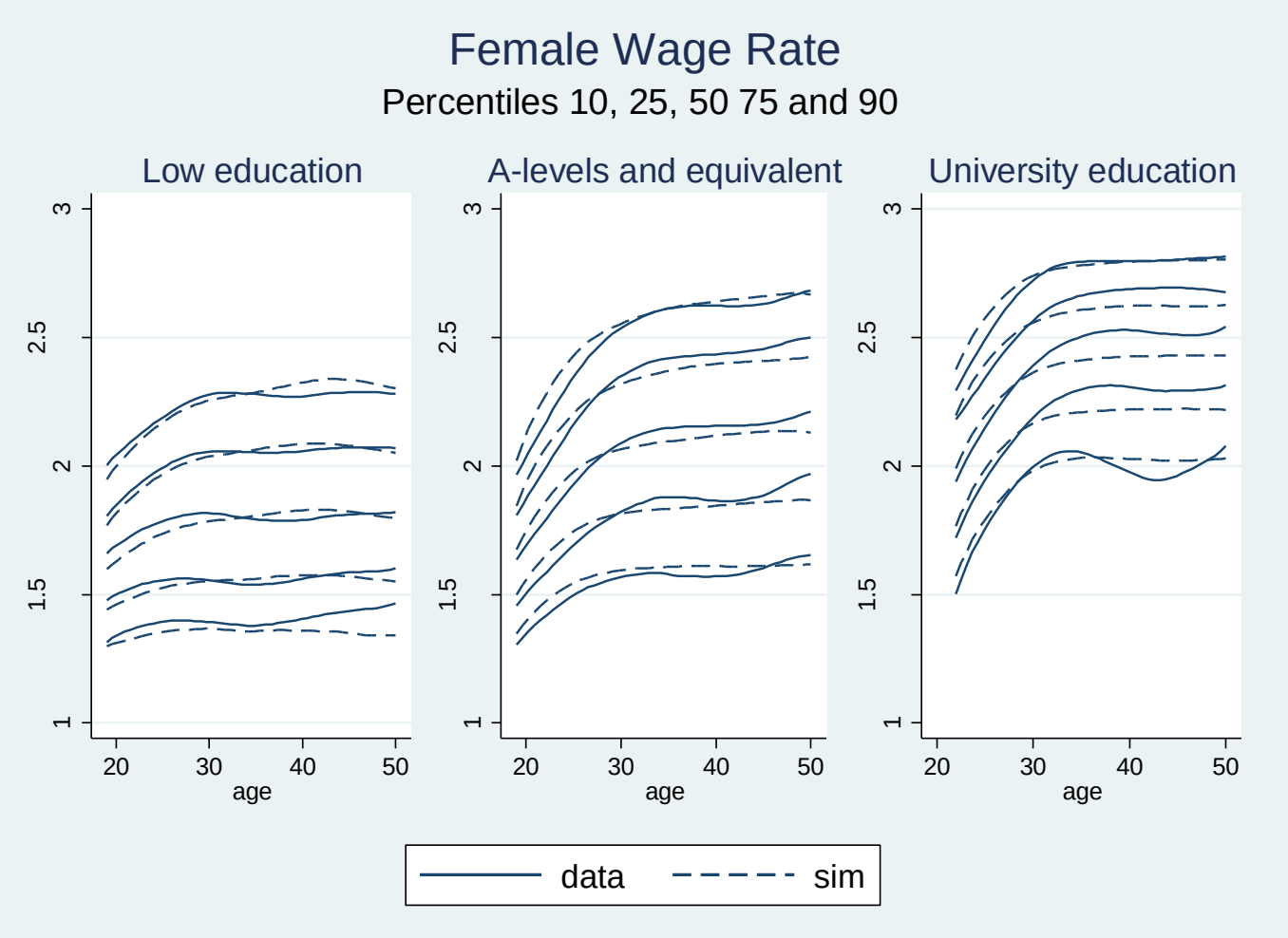
Model: key features (2)

- Heterogeneous individuals
  - Start of life: preferences for work/study, ability, initial wealth
  - During life: family formation, productivity (health)
- Uncertainty faced by individuals
  - Own productivity (health)
  - Family dynamics: partnering/separation, child bearing
  - Partner employment and income
  - Personal insurance mechanisms include human capital and savings

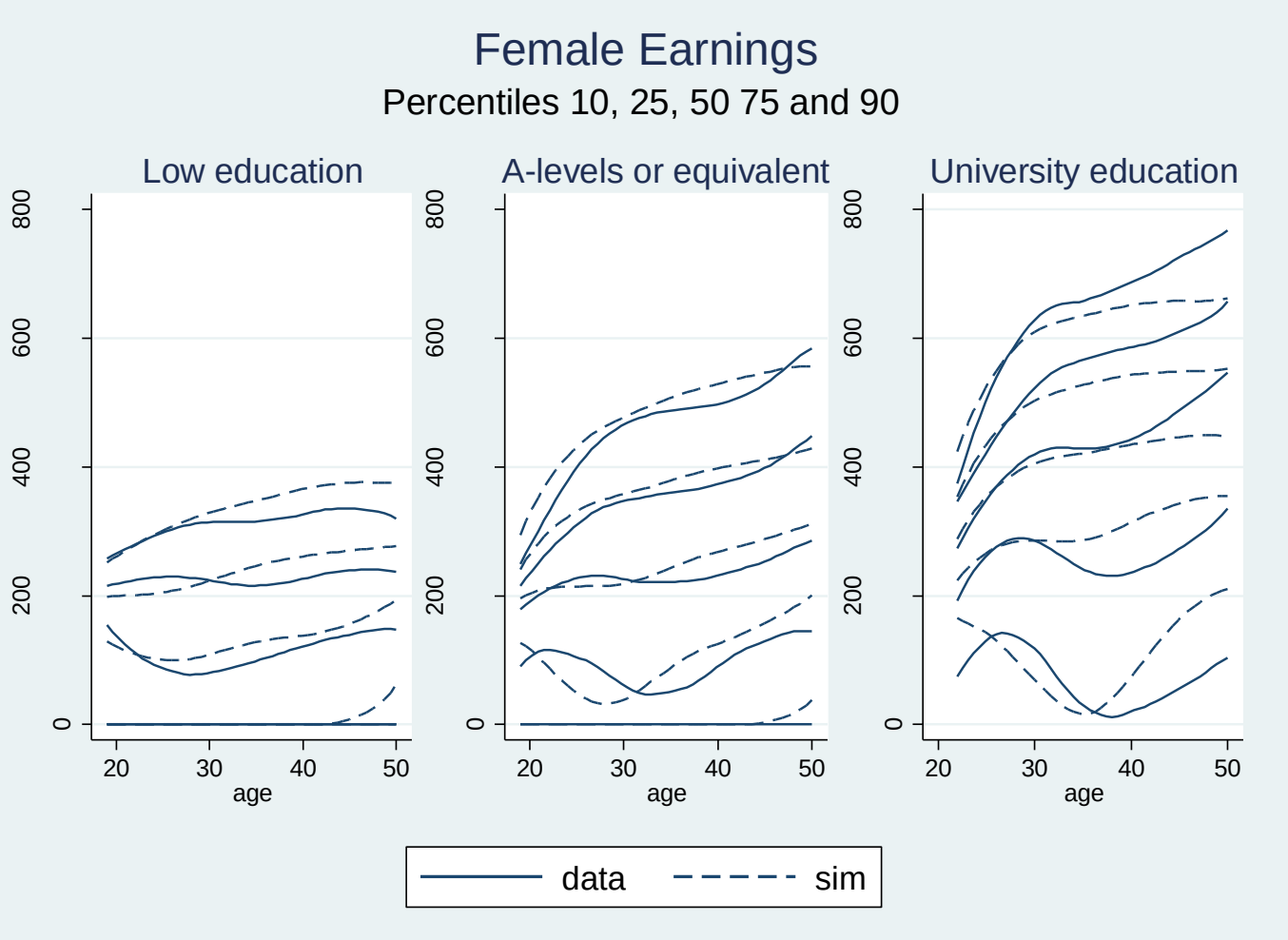
Model: key features (3)

- Individual decisions conditioned by market failures
  - Insurance market
  - Credit market
- Role for policy
  - Redistribution: *ex-ante* inequality and permanent productivity shocks
  - Mutualising risk by facilitating life-cycle transfers
    - transitory income shocks in the presence of market failures
- Detailed UK personal tax and benefit system

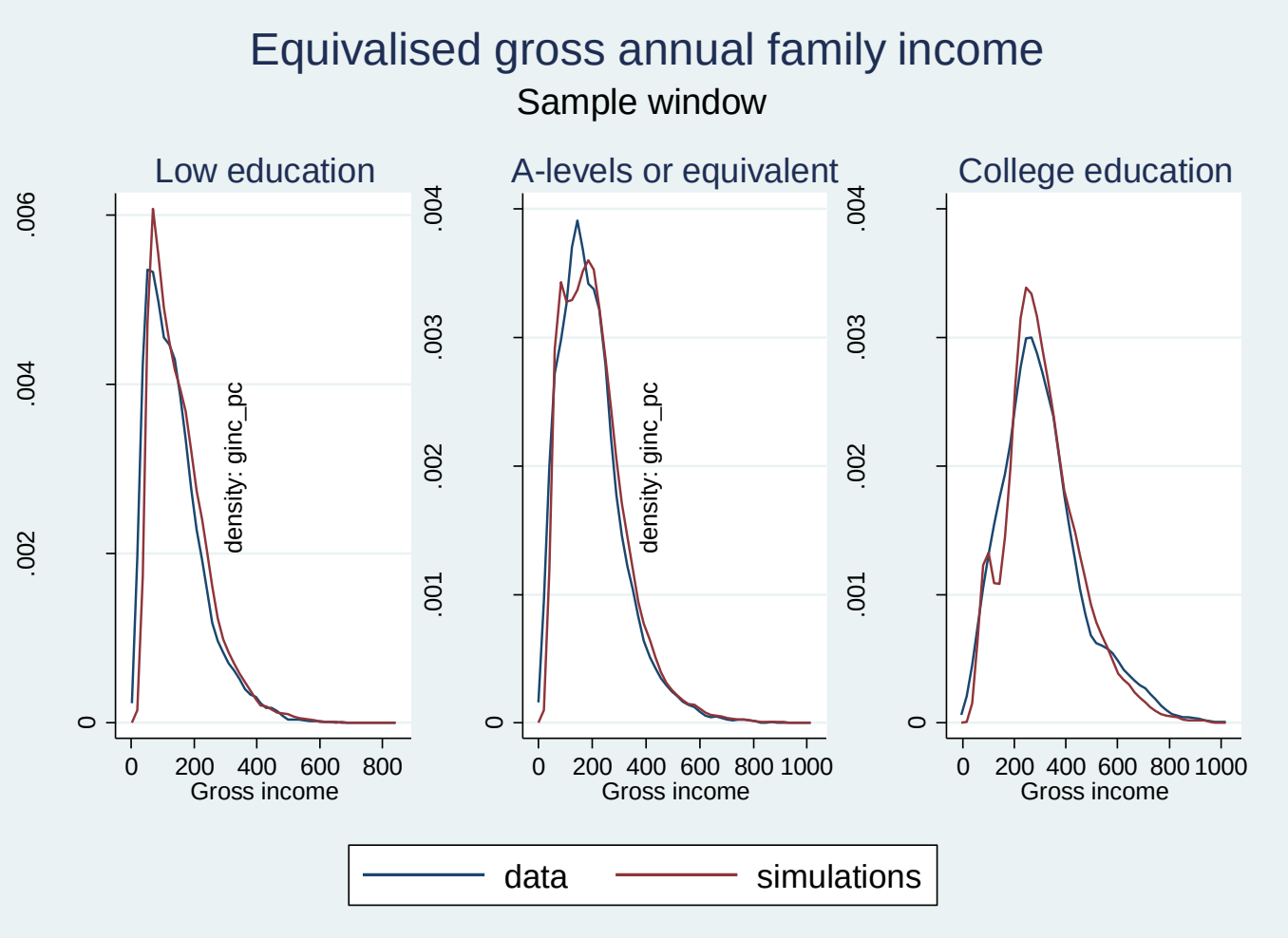
Model fit (1): Female wage rates



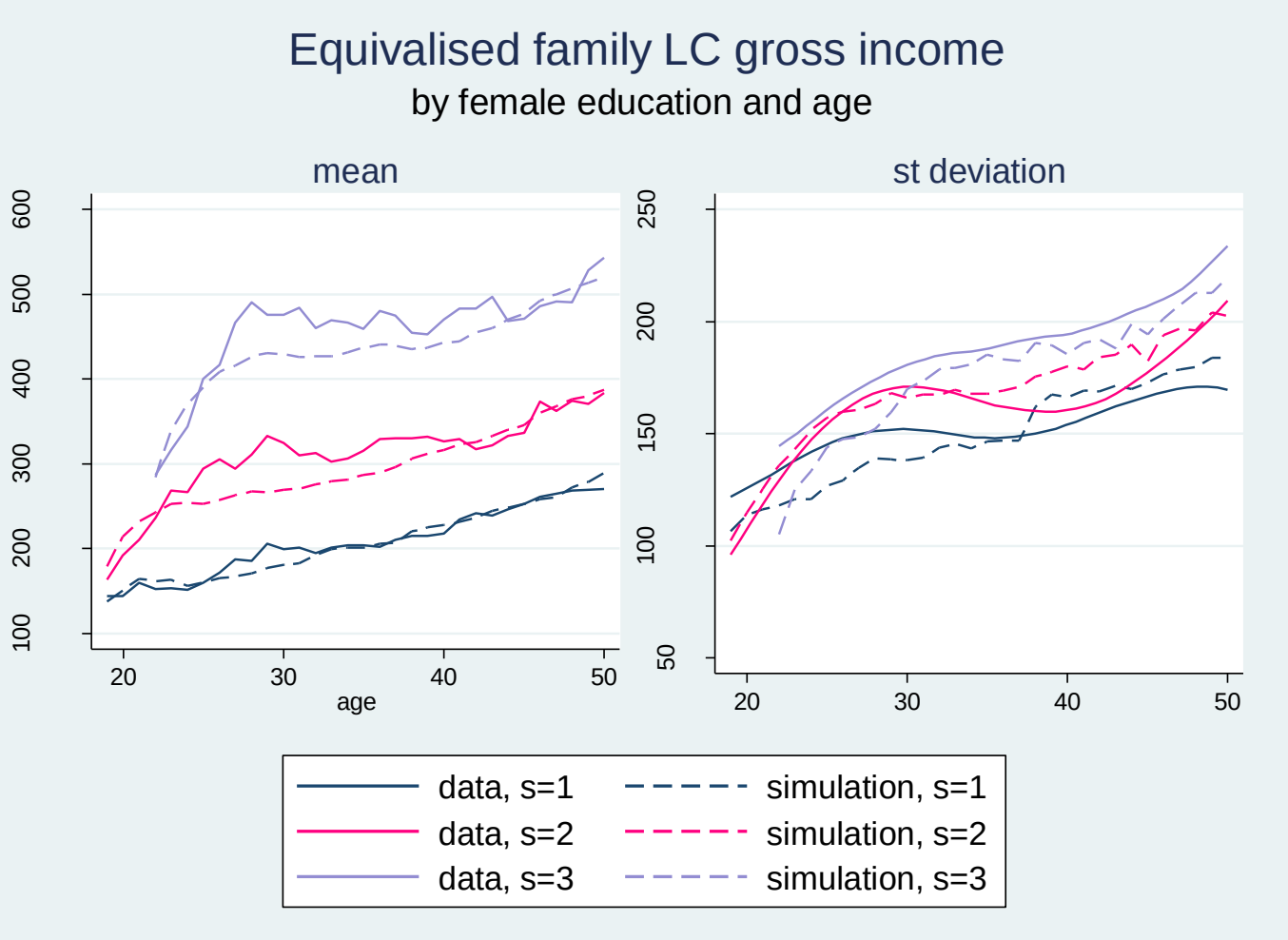
Model fit (2): Female earnings



Model fit (3): Gross income distributions



Model fit (4): gross income across the lifecycle



Q1: How do financial work incentives change over lifecycle?

METR and PTR

- Definition: proportion of the change in gross family earnings from changing hours of work lost to increased taxes and reduced benefits
- Difference between METR and PTR is size of hours change

$$METR \ / PTR = 1 - \frac{Y_1 - Y_0}{E_1 - E_0}$$

E_0 = gross family earnings

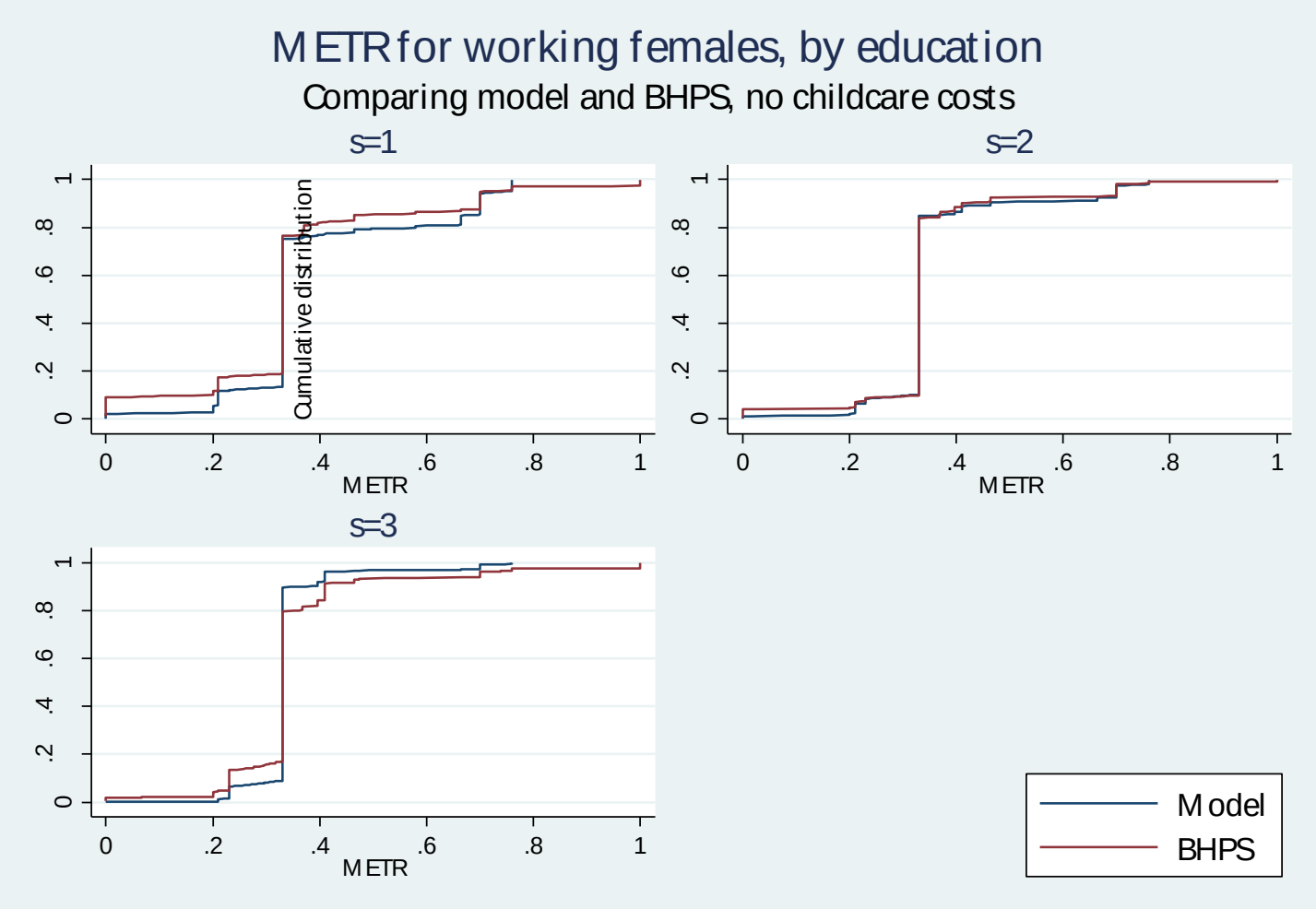
E_1 = incremented gross family earnings

Y_0 = net family earnings

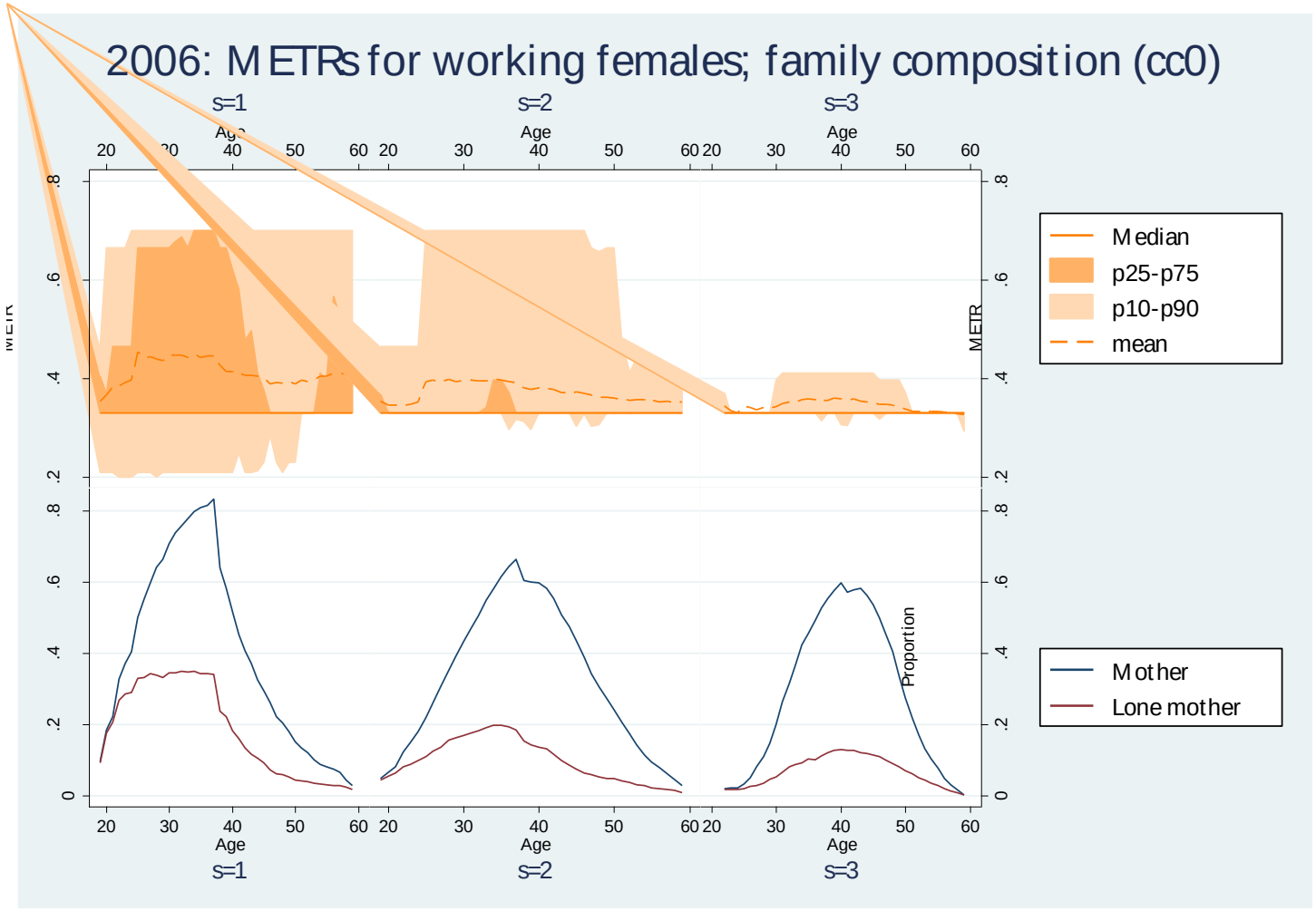
Y_1 = incremented net family earnings

- We treat childcare two ways:
  - "No childcare costs"
  - "Varying childcare costs" – treated like a tax
- METR based on working one extra hour

METR by education level



METR over the lifecycle by education level



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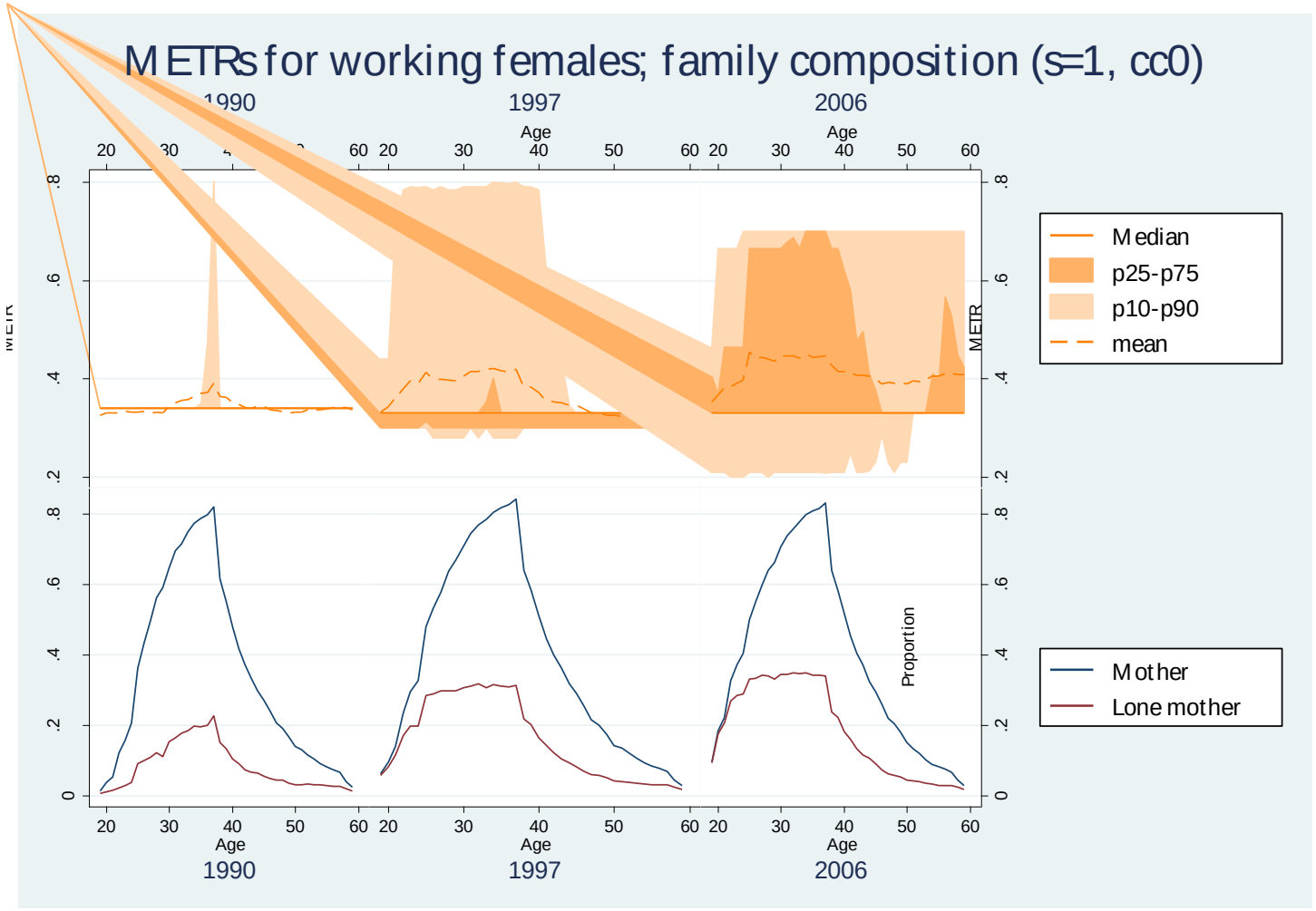
METR over the lifecycle for different tax systems



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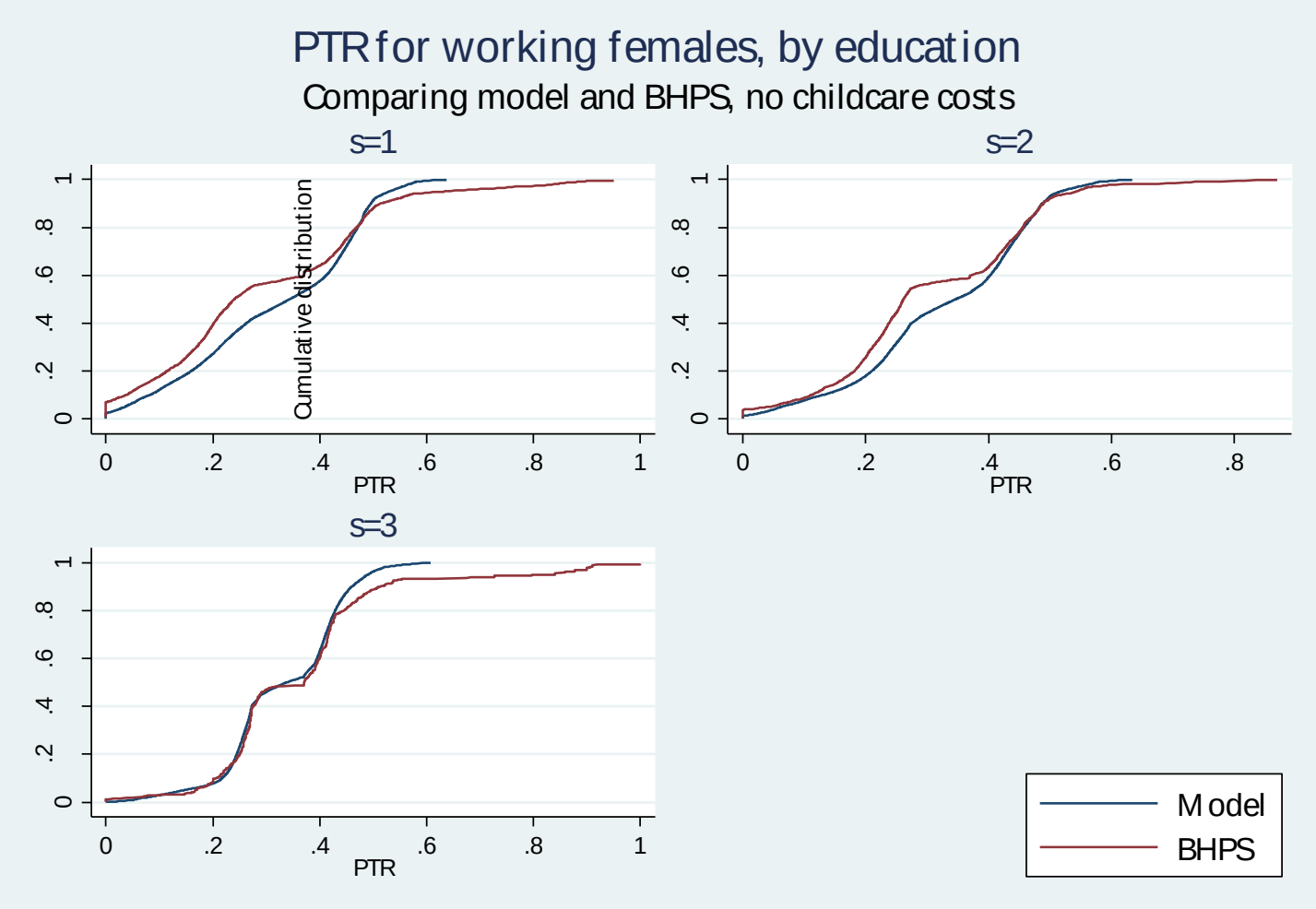
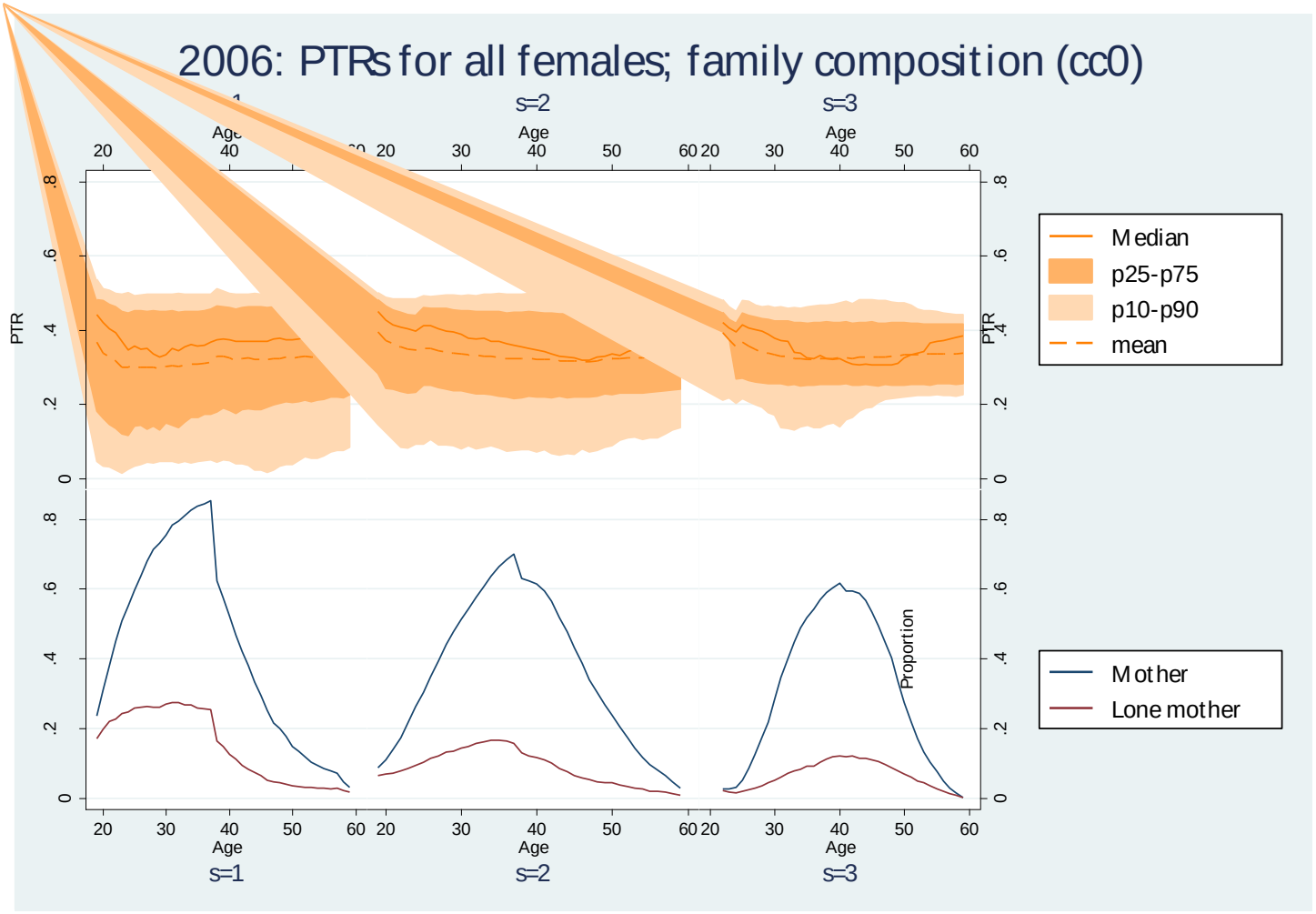
PTR by education level



PTR over the lifecycle by education level



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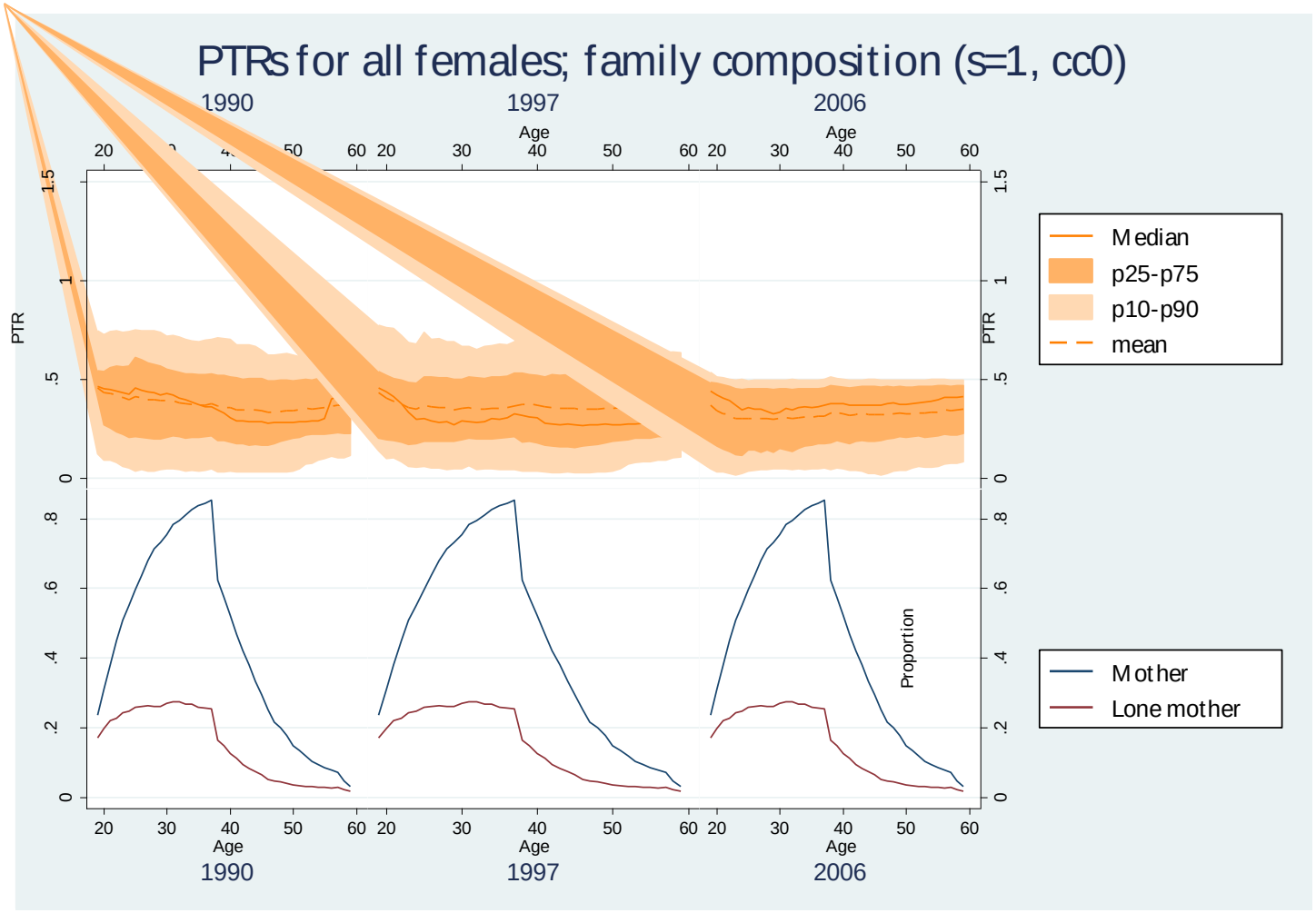
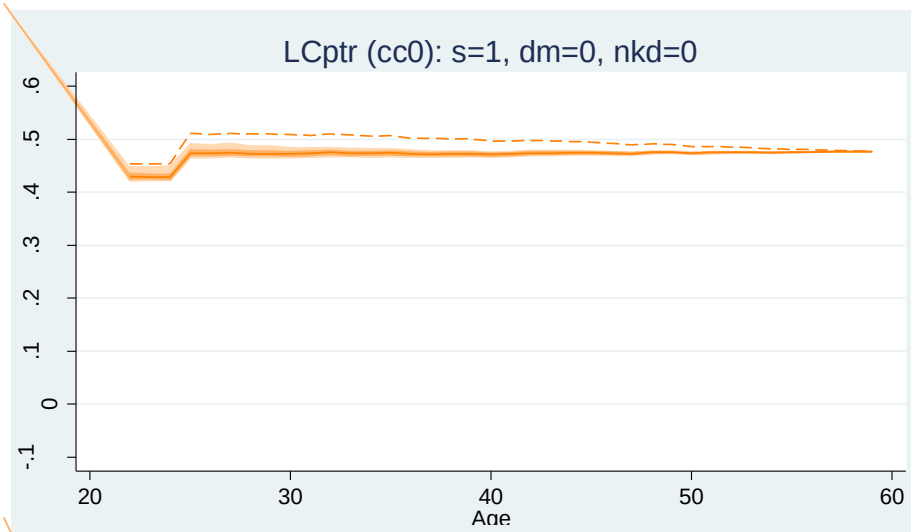
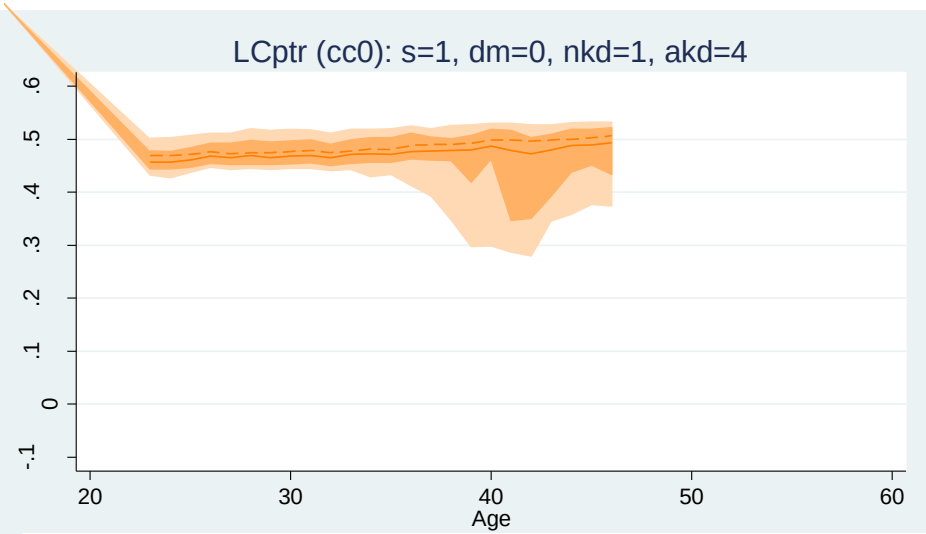
PTR over the lifecycle for different tax systems

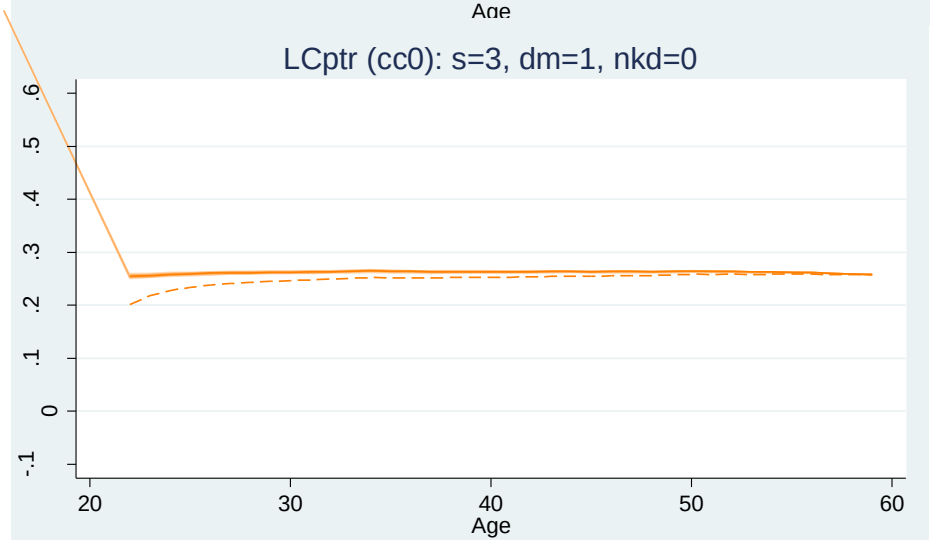


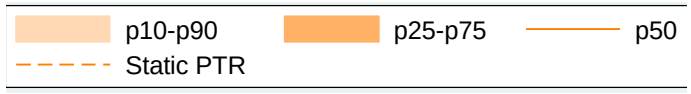
Lifecycle PTR by age, for selected family types

1999 tax system; no childcare costs









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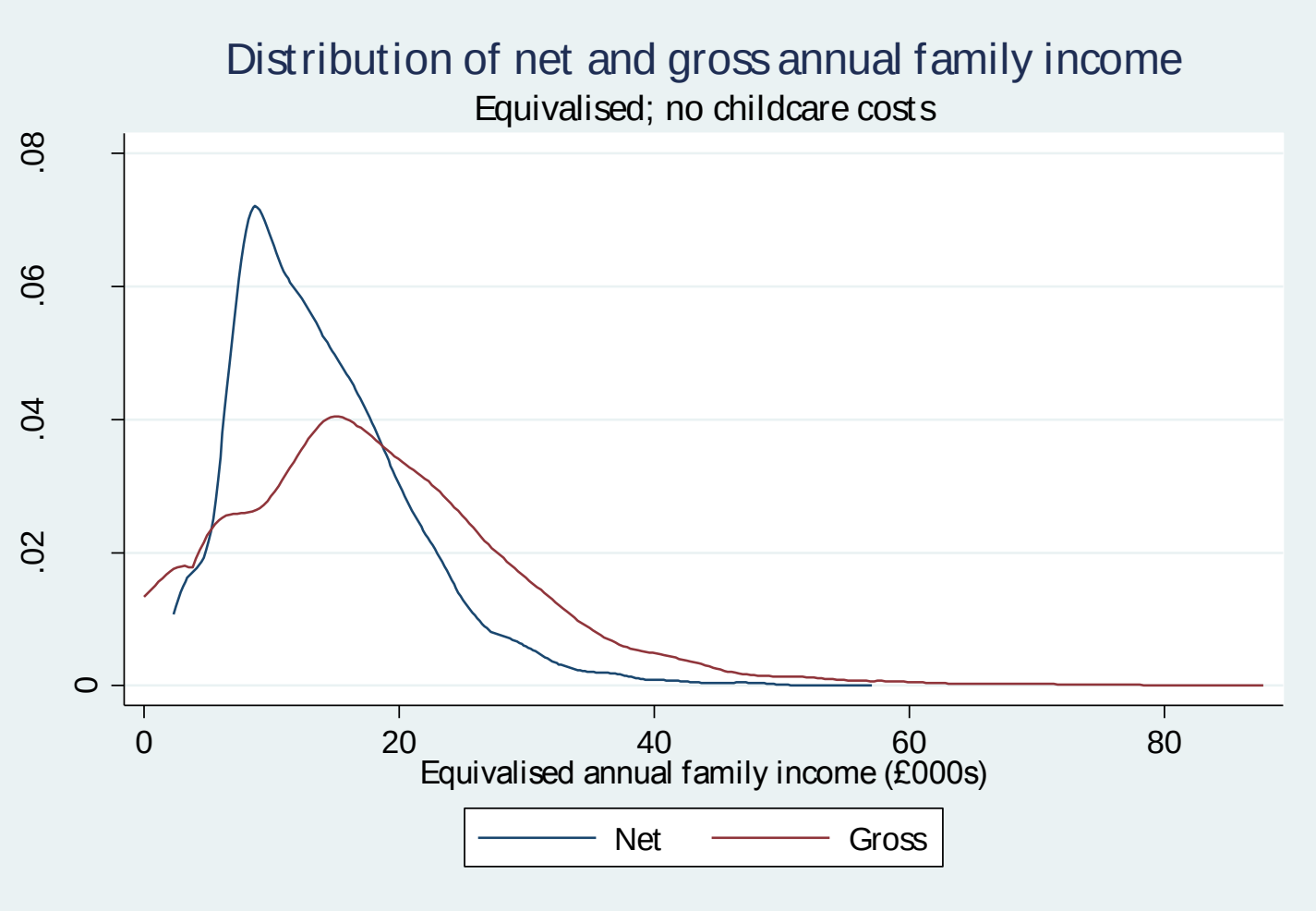
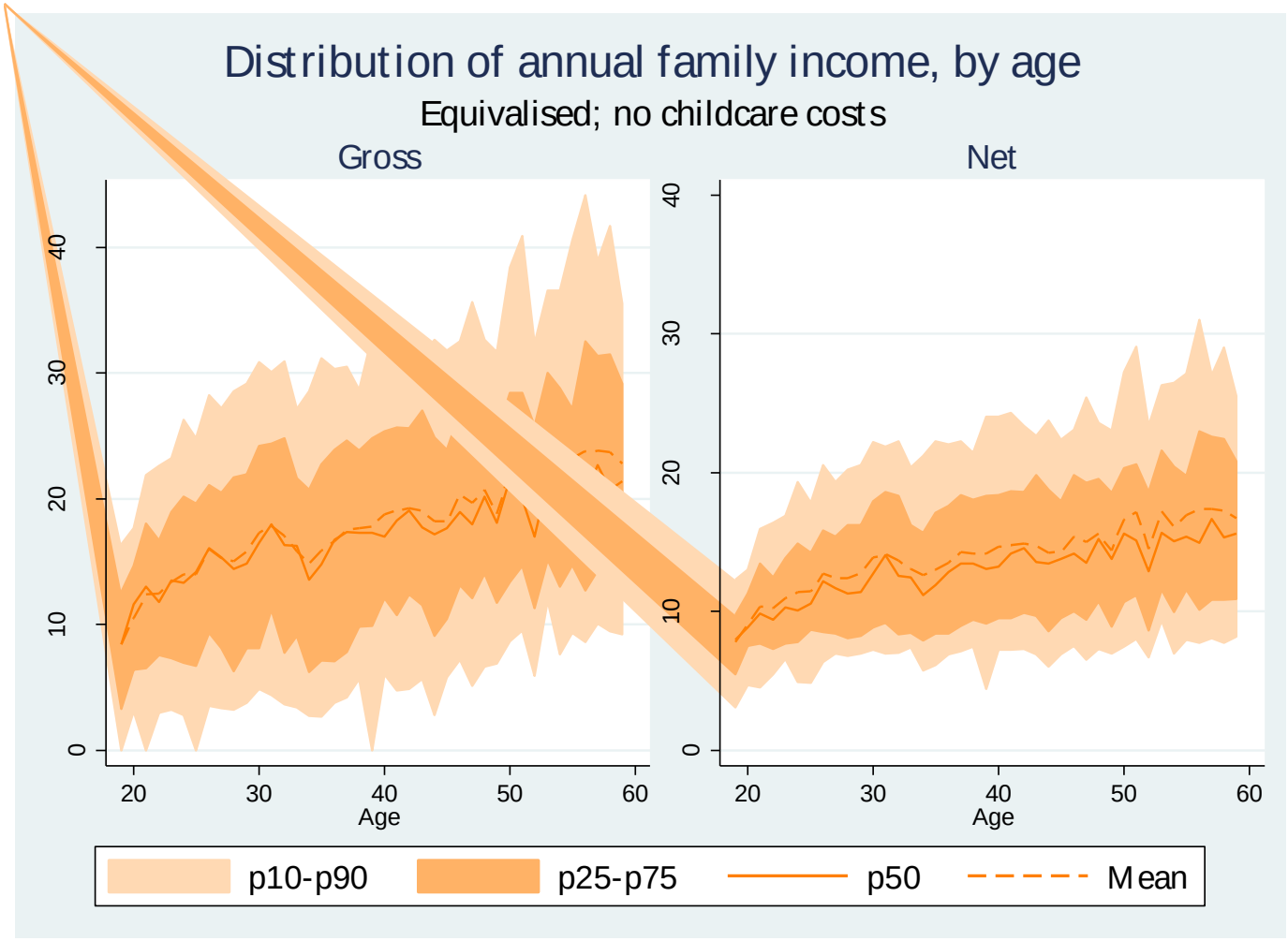
Q2: How is tax burden distributed over the lifecycle and population?

Distribution of annual family income
2006 tax system



Distribution of annual family income by age

2006 tax system



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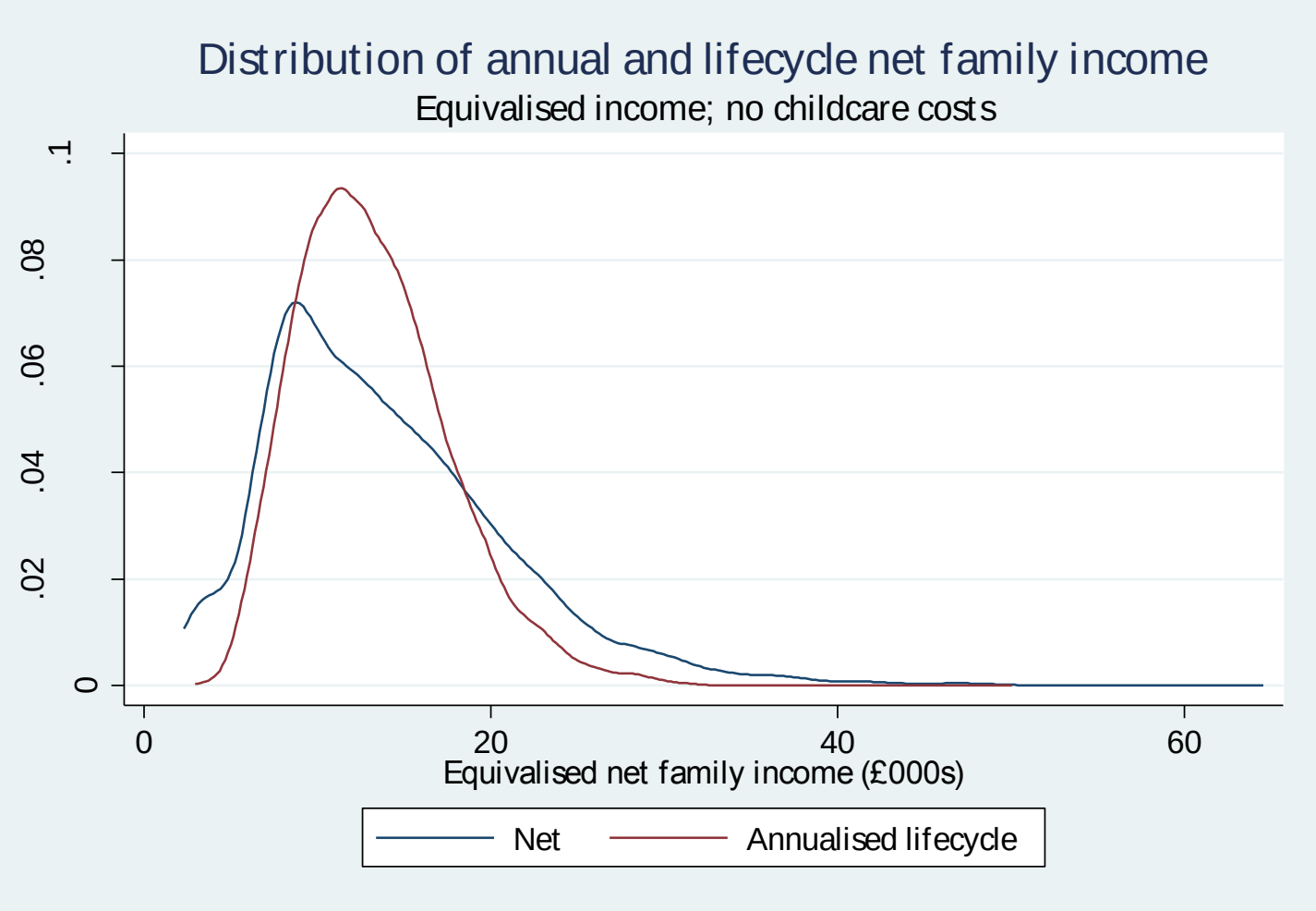
Distribution of annual and lifetime net income
2006 tax system

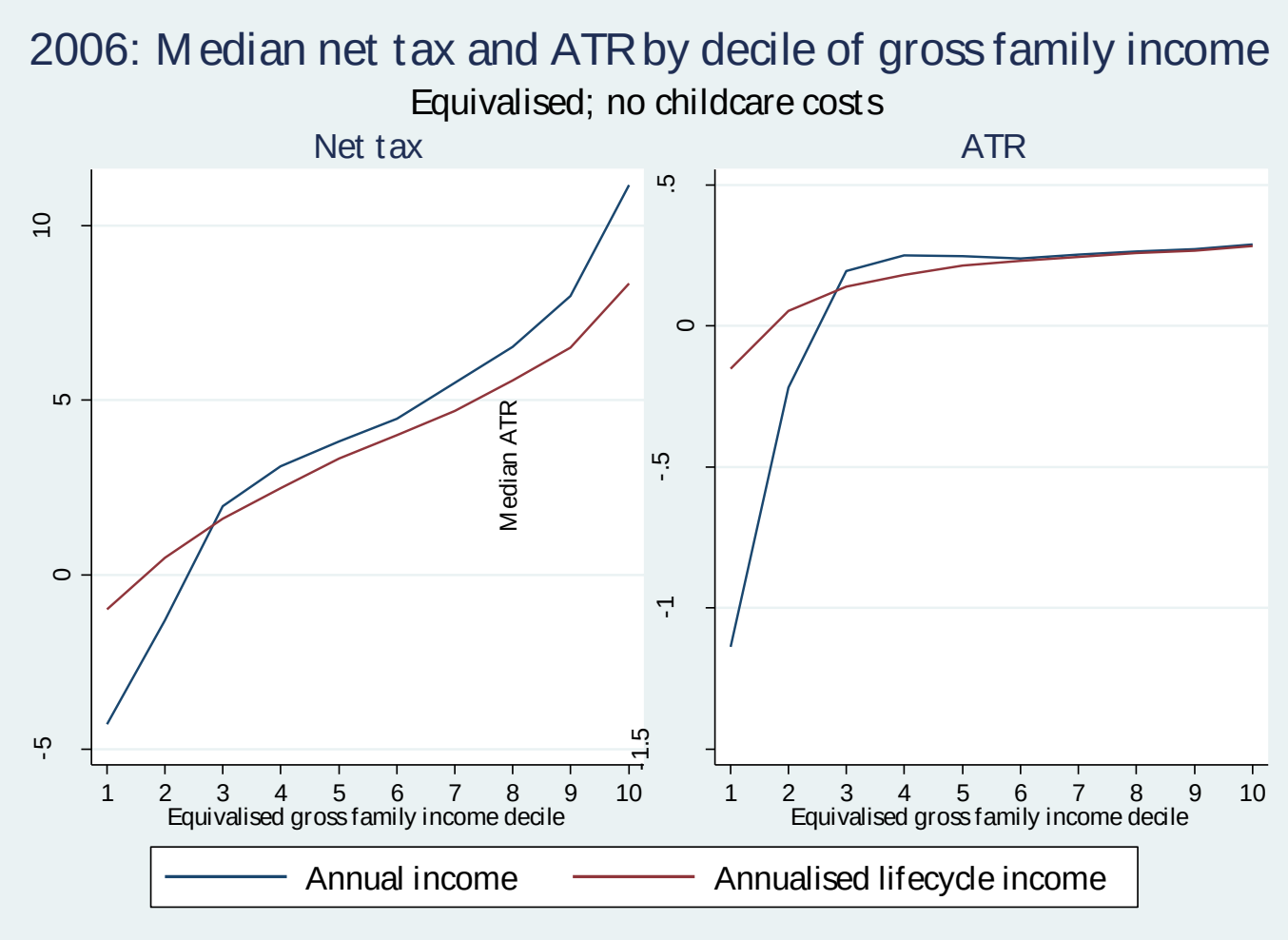


Decomposition of lifecycle inequality by source

2006 tax system

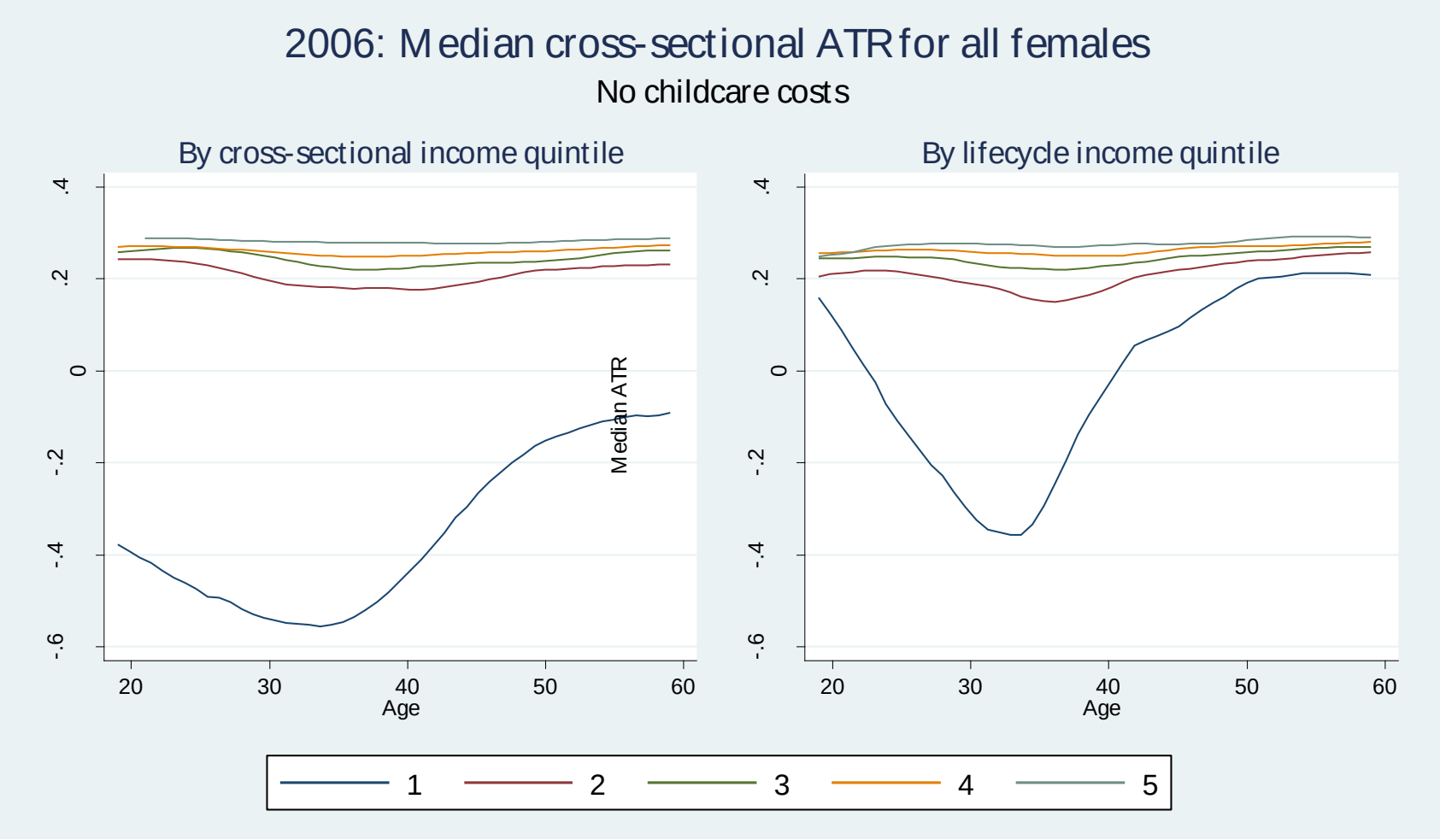
	Initial conditions	Education	Family	Residual	Total
Female earnings	0.314	0.244	0.020	0.419	1
Equivalised gross family income	0.169	0.234	0.055	0.538	1
Equivalised net family income	0.174	0.216	0.035	0.571	1
% reduction in variance	62.1	65.9	76.0	60.8	63.1

Median net tax and ATR by gross income decile
2006 tax system



Median cross-sectional ATR by age and quintile

2006 tax system



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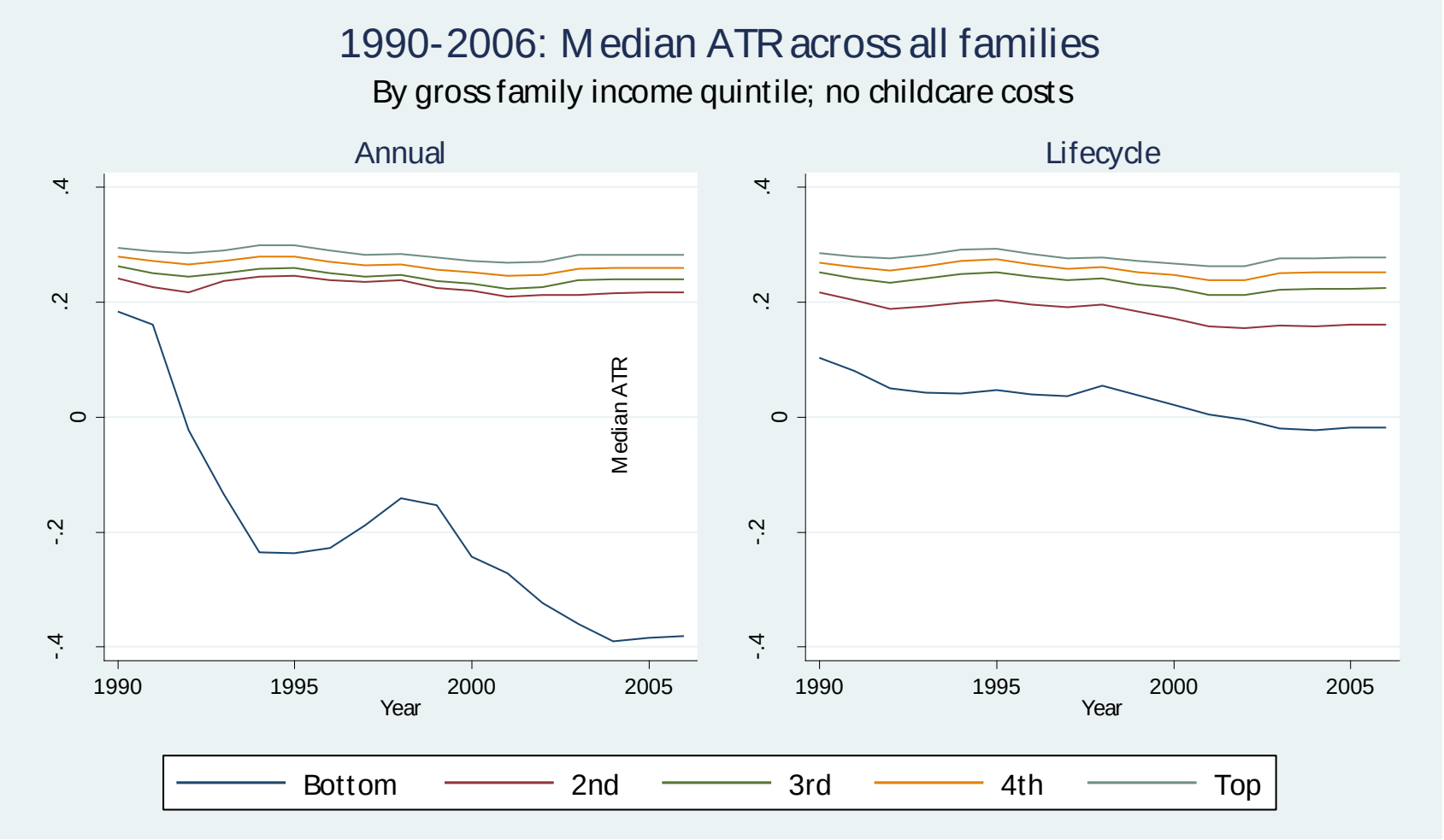
Median ATR over time, by income quintile
2006 tax system



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Conclusions

Work incentives

- In-work benefits are key
- Complete picture of work incentives summarised by lifecycle PTR

Redistribution

- Tax and benefit system less redistributive from lifecycle perspective than cross-sectional perspective
- Initial conditions and education account for over half of variability in lifecycle earnings